

Appln No. 09/147,970

Supplemental Amendment dated June 3, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A method for transferring data from a first switch to a second switch, selectively by line-switching or packet switching, comprising:

a) locating the first switch or the second switch at an end terminal of a user for connecting the end terminal to a packet-switching network or a line-switching network, the first switch having access to a line-switching network;

b) establishing a connection through the line-switching network from the first switch to an access point of the packet-switching network;

c) line-switching transferring of data through said connection from the first switch to the access point of the packet-switching network;

d) packeting of the data into data packets if the data do not yet exist as data packets, and packet-switching transferring of the data packets through the packet-switching network from the access point to the second switch;

e) checking repeatedly whether a control signal exists for changing-over to a line-switching connection to the second switch;

f) establishing the line-switching connection, during an existing transfer, from the first switch to the second switch

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through the line-switching network with a presence of the control signal, if the line-switching connection is not yet present; and

g) changing-over to a line-switching data transfer during the existing transfer and transferring data over the line switching connection to the second switch.

2. (previously presented) A method for transferring data from a first switch to a second switch, selectively by line-switching or packet switching, comprising:

a) locating the first switch or the second switch at an end terminal of a user connecting the end terminal to a packet-switching network or a line-switching network, the first switch having access to the line-switching network and the packet switching network;

b) packeting the data into data packets in the first switch if the data does not yet exist as data packets;

c) packet-switching transferring of the data packets through the packet-switching network to the second switch;

d) checking repeatedly whether a control signal exists for transferring to a line-switching connection to the second switch;

e) establishing the line-switching connection, during an existing transfer, through the line-switching network to the second switch with a presence of the control signal, if the line-switching connection is not yet present; and

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f) changing-over to a line-switching data transfer during the existing transfer and transferring data over the line switching connection to the second switch.

3. (previously presented) The method according to claim 1 or 2 wherein the data packets after changing over to the line-switching data transfer remain as data packets and are transferred as such by line-switching.

4. (previously presented) The method according to claim 1 or 2 wherein the data packets after changing to the line-switching data transfer are unpacketed, more particularly headers of the data packets are removed.

5. (previously presented) The method according to claim 1 wherein a same data channel is used to send the data packets to the access point to the packet-switching network and to transfer the data through the line-switching network to the second switch.

6. (previously presented) The method according to claim 1 wherein data packets are transferred to the access point to the packet-switching network through a first data channel and the data are transferred for line-switching to the second switch through a second data channel.

7. (previously presented) The method according to claim 1 or 2 wherein the line-switching network is an ISDN network

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having ISDN switches, the data packets have a TCP/IP format and data channels used for the line-switching data transfer are ISDN B channels.

8. (previously presented) The method according to claim 1 or 2 wherein the control signal which triggers a change-over between the line-switching transfer and the packet-switching transfer is produced automatically when demands on a quality of a data transfer such as a time delay or a noise proportion is understepped or exceeded.

9. (previously presented) The method according to claim 1 wherein, with the line-switching data transfer between the first switch and the second switch or between the first switch and the access point to the packet-switching network, the data of several users are multiplexed on one data channel by forming sub-channels of a fixed bandwidth.

10. (previously presented) The method according to claim 9 wherein the data of the user when line-switching is selected, are transferred line-switched with a transfer rate which corresponds to a fraction of the transfer rate of a bandwidth which is available as standard to the user.

11. (previously presented) The method according to claim 9 or 10 wherein the line-switching network is an ISDN network and the data of the user to be transferred are transferred between the first and the second switches or between the first

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switch and the access point to the packet-switching network on a data channel with a bandwidth which is only a fraction of a standard bandwidth of 64 kbit/s, more particularly 32, 16, 8, 4, 2 or 1 kbit/s.

12. (previously presented) The method according to claim 11 wherein, in the first switch, only every n -th byte or every n -th bit of an ISDN frame is copied over and forwarded on a data channel to the second switch or to the access point to the packet-switching network, whereby an effective bandwidth of the line-switching data transfer is $(64/n)$ kbit/s.

13. (previously presented) The method according to Claim 1 or 2 wherein, with a data transfer from the first switch changing over from a packet-switching data transfer to the line-switching data transfer,

a) an address information of the data packets are evaluated and classified according to a network topology, and

b) for the data packets whose destination addresses correspond to a same topological area of the network, the second switch is selected which is located in the same topological area.

14. (previously presented) The method according to claim 13 wherein, to classify the data packets according to the network topology, the destination addresses of the data packets are sorted according to geographical areas whereby, for data packets whose destination addresses correspond to a same

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geographical area, the second switch is selected to be located in this geographical area.

15. (previously presented) The method according to claim 14 wherein, for classifying the data packets according to geography, the destination addresses are compared with destination addresses stored in a data bank which contains a link between the destination addresses and associated geographical areas.

16. (previously presented) The method according to claim 1, when the data is being transferred using the line-switching data transfer, further comprising the steps of:

a) checking repeatedly whether a second control signal exists for changing-over to a packet-switching data transfer to the second switch;

b) establishing a second connection through the line-switching network, during the existing transfer, from the first switch to the access point of the packet-switching network with a presence of the second control signal, if the connection to the access point is no longer present;

c) changing-over to a packet-switching data transfer during the existing transfer;

d) line-switching transferring of the data through the connection or the second connection from the first switch to the access point; and

e) packeting of the data into data packets if the data does not yet exist as data packets, and packet-switching

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transferring of the data packets through the packet switching network from the access point to the second switch.

Claims 17 - 21 (canceled)

22. (previously presented) The method according to claim 2 wherein, with the line-switching data transfer between the first switch and the second switch, the data of several users are multiplexed on one data channel by forming sub-channels of a fixed bandwidth.

23. (previously presented) The method according to claim 22 wherein the data of the user when line-switching is selected, are transferred line-switched with a transfer rate which corresponds to a fraction of the transfer rate of a bandwidth which is available as standard to the user.

24. (previously presented) The method according to claim 22 or 23 wherein the line-switching network is an ISDN network and the data of the user to be transferred are transferred between the first and the second switches on a data channel with a bandwidth which is only a fraction of a standard bandwidth of 64 kbit/s, more particularly 32, 16, 8, 4, 2 or 1 kbit/s.

25. (previously presented) The method according to claim 24 wherein, in the first switch, only every n-th byte or every n-th bit of an ISDN frame is copied over and forwarded on a data

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channel to the second switch, whereby an effective bandwidth of the line-switching data transfer is $(64/n)$ kbit/s.

26. (previously presented) The method according to claim 2, when the data is being transferred using the line-switching data transfer, further comprising the steps of:

a) checking repeatedly whether a second control signal exists for changing-over to a packet-switching data transfer to the second switch;

b) changing-over to a packet-switching data transfer during the existing transfer with a presence of the second control signal; and

c) packeting the data into data packets in the first switch if the data does not yet exist as data packets, and packet-switching transferring of the data packets through the packet-switching network to the second switch.

Claims 27 - 31 (canceled)

32. (previously presented) The method according to claims 1 or 2, wherein the end terminal is part of a local area network.

33. (previously presented) A method for transferring data from a first switch to a second switch, selectively by line-switching or packet switching, comprising:

a) locating the first switch or the second switch at an end terminal of a user for connecting the end terminal to a

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packet-switching network or a line-switching network, the first switch having access to a line-switching network;

b) establishing a connection through the line-switching network from the first switch to an access point of the packet-switching network;

c) line-switching transferring of data through said connection from the first switch to the access point of the packet-switching network;

d) packeting of the data into data packets if the data do not yet exist as data packets, and packet-switching transferring of the data packets through the packet-switching network from the access point to the second switch;

e) checking repeatedly whether a control signal exists for changing-over to a line-switching connection to the second switch;

f) establishing the line-switching connection, during an existing transfer, directly from the first switch to the second switch solely through the line-switching network with a presence of the control signal, if the line-switching connection is not yet present; and

g) changing-over to a line-switching data transfer during the existing transfer and transferring data over the line switching connection to the second switch.

34. (previously presented) A method for transferring data from a first switch to a second switch, selectively by line-switching or packet switching, comprising:

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a) locating the first switch or the second switch at an end terminal of a user connecting the end terminal to a packet-switching network or a line-switching network, the first switch having access to the line-switching network and the packet switching network;

b) packeting the data into data packets in the first switch if the data does not yet exist as data packets;

c) packet-switching transferring of the data packets through the packet-switching network to the second switch;

d) checking repeatedly whether a control signal exists for transferring to a line-switching connection to the second switch;

e) establishing the line-switching connection, during an existing transfer, directly from the first switch to the second switch solely through the line-switching network with a presence of the control signal, if the line-switching connection is not yet present; and

f) changing-over to a line-switching data transfer during the existing transfer and transferring data over the line switching connection to the second switch.

35. (new) A method for transferring data from a first end terminal to a second end terminal using a first switch and a second switch, selectively by line-switching or packet switching, comprising:

a) locating the first switch between the first end terminal and an access point of a packet-switching network, the first switch being part of a line-switching network or having

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access to a line-switching network;

b) establishing a connection via the first switch through the line-switching network from the first end terminal to the access point of the packet-switching network;

c) line-switching transferring of non-packetized data through said connection from the first end terminal to the access point of the packet-switching network;

d) packeting of the data into data packets and packet-switching transferring of the data packets through the packet-switching network from the access point to the second switch;

e) checking repeatedly whether a control signal exists for transferring to a line-switching connection to the second switch;

f) establishing the line-switching connection, during an existing transfer, through the line-switching network from the first switch to the second switch with a presence of the control signal, if the line-switching connection is not yet present; and

g) changing-over to a line-switching data transfer during the existing transfer and transferring data over the line-switching connection to the second switch and from the second switch to the second end terminal.

36. (new) The method of claim 35, wherein the first end terminal is a telephone.

37. (new) The method of claim 36, wherein the telephone is an analog telephone.

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38. (new) The method of claim 36, wherein the telephone is an ISDN telephone.

39. (new) The method of claim 36, wherein the telephone is a mobile telephone.

40. (new) The method of claim 35, wherein the first end terminal is part of a local area network.

41. (new) The method of claim 35, wherein the first end terminal is connected to a private branch exchange (PBX), which is in turn connected to the first switch.

42. (new) The method of claim 35, wherein the data transferred from the first end terminal to the access point of the packet-switching network are analog data.

43. (new) The method of claim 42, wherein the data, when transferred over the line-switching connection to the second switch, remain as analog data.

44. (new) The method of claim 35, wherein the data transferred from the first end terminal to the access point of the packet-switching network are digital, non-packetized data.

45. (new) The method of claim 35, in which transferring the data over the line-switching connection comprises transferring the data over an PSTN/ISDN network.

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46. (new) The method of claim 35, in which transferring the data through the packet-switching network comprises transferring the data through the internet.

47. (new) The method of claim 35, wherein the first switch is located at the first end terminal.

48. (new) The method of claim 35, wherein the control signal which triggers a change-over between the packet-switching transfer and the line-switching transfer is produced automatically when demands on a quality of a data transfer, including a time delay or a noise proportion, is understepped or exceeded.

49. (new) The method of claim 35, wherein the control signal which triggers a change-over between the packet-switching transfer and the line-switching transfer is produced by a user of the first end terminal.

50. (new) The method of claim 35, wherein, when the data is being transferred using the line-switching data transfer, further comprising:

a) checking repeatedly whether a second control signal exists for changing-over to a packet-switching data transfer to the second switch;

b) establishing a second connection through the line-switching network, during the existing transfer, from the first

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switch to the access point of the packet-switching network with a presence of the second control signal, if the connection to the access point is no longer present;

c) changing-over to a packet-switching data transfer during the existing transfer;

d) line-switching transferring of the data through the connection or the second connection to the access point;

e) packeting of the data into data packets and packet-switching transferring of the data packets through the packet-switching network from the access point to the second switch; and

f) transferring the data from the second switch to the second end terminal.

51. (new) The method according to claim 35, wherein, with the line-switching data transfer between the first switch and the second switch or between the first switch and the access point to the packet-switching network, the data of several end terminals are multiplexed on one data channel by forming sub-channels of a fixed bandwidth.

52. (new) The method according to Claim 35, wherein, with a data transfer from the first switch changing over from a packet-switching data transfer to the line-switching data transfer,

a) address information of the data packets are evaluated and classified according to a network topology, and

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b) for the data packets whose destination addresses correspond to a same topological area of the network, the second switch is selected which is located in the same topological area.

53.(new) The method according to claim 52 wherein, to classify the data packets according to the network topology, the destination addresses of the data packets are sorted according to geographical areas whereby, for data packets whose destination addresses correspond to a same geographical area, the second switch is selected to be located in this geographical area.

54. (new) The method according to claim 53 wherein, for classifying the data packets according to geography, the destination addresses are compared with destination addresses stored in a data bank which contains a link between the destination addresses and associated geographical areas.

55. (new) A method for transferring data from a first end terminal to a second end terminal, selectively by line-switching or packet switching, comprising:

a) establishing a connection through a line-switching network from the first end terminal to an access point of a packet switching network;

b) line-switching transferring of non-packetized data through said connection from the first end terminal to the access point of the packet-switching network;

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c) packeting of the data into data packets and packet-switching transferring of the data packets through the packet-switching network from the access point to the second end terminal;

d) checking repeatedly whether a control signal exists for transferring to a line-switching connection to the second end terminal;

e) establishing the line-switching connection, during an existing transfer, through the line-switching network from the first end terminal to the second end terminal with a presence of the control signal, if the line-switching connection is not yet present; and

f) changing-over to a line-switching data transfer during the existing transfer and transferring data over the line-switching connection to the second end terminal.

56. (new) The method of claim 55, wherein the first end terminal is a telephone.

57. (new) The method of claim 56, wherein the telephone is an analog telephone.

58. (new) The method of claim 56, wherein the telephone is an ISDN telephone.

59. (new) The method of claim 56, wherein the telephone is a mobile telephone.

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60. (new) The method of claim 55, wherein the first end terminal is part of a local area network.

61. (new) The method of claim 55, wherein the data transferred from the first end terminal to the access point of the packet-switching network are analog data.

62. (new) The method of claim 61, wherein the data, when transferred over the line-switching connection to the second end terminal, remain as analog data.

63. (new) The method of claim 55, wherein the data transferred from the first end terminal to the access point of the packet-switching network are digital, non-packetized data.

64. (new) The method of claim 55, in which transferring the data over the line-switching connection comprises transferring the data over an PSTN/ISDN network.

65. (new) The method of claim 55, in which transferring the data through the packet-switching network comprises transferring the data through the internet.

66. (new) The method of claim 55, wherein the control signal which triggers a change-over between the packet-switching transfer and the line-switching transfer is produced automatically when demands on a quality of a data transfer such

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as a time delay or a noise proportion is understeped or exceeded.

67. (new) The method of claim 55, wherein the control signal which triggers a change-over between the packet-switching transfer and the line-switching transfer is produced by a user of the first end terminal.

68. (new) Switching apparatus for routing a telephone call comprising non-packetized data from a first end terminal located at a user's premises to a second end terminal located at another user's premises, selectively by line switching or packet switching, the switching apparatus comprising:

means for establishing a connection through a line-switching network to the second end terminal;

means for line-switching transferring data received from the first end terminal as non-packetized data over the line-switching network to the second end terminal;

means for establishing a connection through a packet-switching network to the second end terminal;

means for packet-switching transferring data received from the first end terminal as non-packetized data over the packet-switching network to the second end terminal; and

means responsive to a control signal for transferring to a line-switching transfer or a packet-switching transfer to the second end terminal;

said means responsive to a control signal changing-over to a line-switching data transfer or a packet-switching transfer

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during the existing transfer with the presence of said control signal.

69. (new) The switch of claim 68, further comprising means to produce the control signal for transferring to a line-switching transfer or a packet-switching transfer to the second end terminal, said control signal being produced automatically when demands on the quality of the data transfer are understepped or exceeded.

70. (new) The switch of claim 68, wherein the data received from the first end terminal are analog data.

71. (new) The switch of claim 70, wherein the data, when transferred over the line-switching connection to the second end terminal, remain as analog data.

72. (new) The switch of claim 68, wherein the data received from the first end terminal are digital, non-packetized data.